

# PATENT ABSTRACTS OF JAPAN

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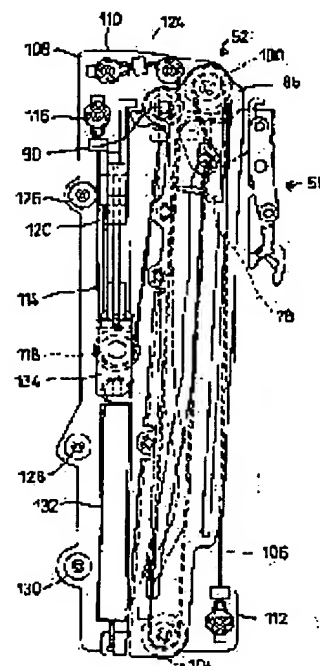
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## (54) THREADING DEVICE OF SEWING MACHINE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a threading device of a sewing machine which lessens the amount of operation of an operator.

**SOLUTION:** One side of a first string-like member 106 is supported immovably by a fixed support pin 110 of an immovable support member 108, while the other side thereof is supported movably by a pulley 100 of a movable support member. A pulley 104 is in contact with the first string-like member 106 between the supported sides thereof and moves it. A first interlocking member 78 is connected to the first string-like member 106 on the left side of the portion of the member that is in contact with the pulley 104, while a thread holding member 50 as the threading mechanism is connected to the member 78.



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CLAIMS

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[Claim(s)]

[Claim 1] In the threader equipment of the sewing machine which has the threader device in which it approaches and estranges to a needle The 1st support device which supports impossible [ migration of the one side of the 1st string-like part material of predetermined die length, and said 1st string-like part material ], and supports the other side movable, While connecting with said 1st string-like part material of said other side rather than the part which contacted the 1st string-like part material while being supported by said 1st support device, and contacted the 1st migration member which moves said 1st string-like part material, and said 1st migration member Threader equipment of the sewing machine characterized by having the 1st interlocking member connected with said threader device.

[Claim 2] Threader equipment of the sewing machine according to claim 1 characterized by being stretched by said the 1st support device and said 1st fall block as said 1st migration member is the 1st fall block supported movable and said 1st string-like part material turned up in the contact part with said 1st fall block.

[Claim 3] The 2nd support device which supports impossible [ migration of the one side of the 2nd string-like part material other than said 1st string-like part material, and said 2nd string-like part material ], and supports the other side movable, While connecting with said 2nd string-like part material of said other side rather than the part which contacted the 2nd string-like part material while being supported by said 2nd support device, and contacted the 2nd migration member which moves said 2nd string-like part material, and said 2nd migration member Threader equipment of a sewing machine given in the claims 1 or 2 characterized by having the 2nd interlocking member connected with said 1st migration member.

[Claim 4] It has the elastic body which pulls back said 2nd string-like part material. Said 2nd interlocking member, It is fixed so that the migration supporter material which supports the other side of said 1st string-like part material movable may move to said 1st migration member and a list in one. Threader equipment of the sewing machine according to claim 3 by which said 1st string-like part material of said other side is characterized by being supported impossible [ migration ] rather than said migration supporter material.

[Claim 5] Threader equipment of the sewing machine according to claim 4 or 3 characterized by being stretched by said the 2nd support device and said 2nd fall block as said 2nd migration member is the 2nd fall block supported movable and said 2nd string-like part material turned up in the contact part with said 2nd fall block.

[Claim 6] Threader equipment of the sewing machine according to claim 1 to 5 characterized by having the hook by which said threader device moves to the eye hole of said needle, and said hook moving up and down by migration of said 1st interlocking member, and approaching the eye hole of said needle and estranging.

[Claim 7] Threader equipment of the sewing machine according to claim 1 to 6 characterized by having the yarn attachment component to which said threader device holds yarn, and said yarn attachment component moving up and down by migration of said 1st interlocking member, and approaching said needle and estranging.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the threader equipment of the sewing machine which has the threader device in which it approaches and estranges to a needle.

[0002]

[Description of the Prior Art] The threader equipment of a sewing machine has conventionally a thing equipped with the threader rod which supports the hook which can pass through the eye hole of a needle, the set-up member which yarn holds and stretches yarn, and its hook and set-up member to a lower limit, and the threader lever which goes up and down the threader rod. This threader equipment is arranged above the range where a needle moves up and down so that it may not collide with the needle moving up and down. For example, it is threader equipment of a sewing machine given in JP,7-71596,B by these people. With the threader equipment of this official report, if a threader rod is supported possible [ vertical movement ], the end of a threader lever is connected with that upper limit and an operator pushes the other end of a threader lever caudad, a threader rod will descend to a threader lever and one. And the yarn stretched in front of the eye hole of a needle is drawn in the eye hole of a needle by hook. That is, it was the amount of rise and fall for the control input of a threader lever to approach the eye hole of the needle of a hook or a set-up member, and estrange mostly.

[0003]

[Problem(s) to be Solved by the Invention] However, threader equipment has been arranged above the range where a needle moves up and down, and there was a trouble that there were many control inputs according that the control input of a threader lever is the amount of rise and fall to the eye hole of a threader rod or the needle of a set-up member mostly to an operator.

[0004] This invention is being made in order to solve the trouble mentioned above, and offering the threader equipment of a sewing machine with few control inputs of an operator.

[0005]

[Means for Solving the Problem] In order to attain this purpose, the threader equipment of a sewing machine according to claim 1 The 1st support device which supports impossible [ migration of the one side of the 1st string-like part material of predetermined die length, and said 1st string-like part material ], and supports the other side movable, While connecting with said 1st string-like part material of said other side rather than the part which contacted the 1st string-like part material while being supported by said 1st support device, and contacted the 1st migration member which moves said 1st string-like part material, and said 1st migration member It has the 1st interlocking member connected with said threader device.

[0006] And said 1st support device is supported impossible [ migration of the one side of said 1st string-like part material ], and is supporting the other side of said 1st string-like part material movable. If it moves so that it may estrange from the part by which said 1st migration member was supported impossible [ migration of said 1st string-like part material ] Since said 1st string-like part material of the other side moves to one side rather than said 1st migration member and the 1st string-like part material moves on both sides of the 1st migration member rather than said 1st migration member, the 1st string-like part material which moved is longer than the migration length of the 1st migration member. Therefore, the 1st interlocking member moves with said the 1st string-like part material and threader device.

[0007] The threader equipment of a sewing machine according to claim 2 is equipped with the 1st migration member which is the 1st fall block supported movable, and the 1st string-like part material stretched by said the 1st support device and said 1st fall block as turned up in the contact part with said 1st fall block. And on the other hand, said 1st string-like part material turns up and moves in the direction of another side from a

direction by rotation of said 1st fall block.

[0008] The 2nd string-like part material with the threader equipment of a sewing machine according to claim 3 other than said 1st string-like part material, The 2nd support device which supports impossible [ migration of the one side of said 2nd string-like part material ], and supports the other side movable, While connecting with said 2nd string-like part material of said other side rather than the part which contacted the 2nd string-like part material while being supported by said 2nd support device, and contacted the 2nd migration member which moves said 2nd string-like part material, and said 2nd migration member It has the 2nd interlocking member connected with said 1st migration member.

[0009] And said 2nd support device is supported impossible [ migration of the one side of the 2nd string-like part material ], and is supporting the other side of the 2nd string-like part material movable. If it moves so that it may estrange from the part by which said 2nd migration member was supported impossible [ migration of said 2nd string-like part material ] Since said 2nd string-like part material of the other side moves to one side rather than said 2nd migration member, said 1st migration member and said 2nd interlocking member are connected and it is rather than said 2nd migration member, said 1st string-like part material is moved by migration of said 2nd string-like part material. Since the 2nd string-like part material moves on both sides of the 2nd migration member at this time, the 2nd string-like part material which moved is longer than the migration length of the 2nd migration member, and the 1st string-like part material which moved is longer than the 2nd string-like part material which moved. Therefore, said 2nd interlocking member moves with said 2nd string-like part material and said 1st migration member.

[0010] The threader equipment of a sewing machine according to claim 4 is equipped with the elastic body which pulls back said 2nd string-like part material, the migration supporter material which supports the other side of said 1st migration member and said 1st string-like part material movable, the 2nd interlocking member which moves in one, and said 1st string-like part material supported more nearly impossible [ migration of the part of said other side ] than said migration supporter material. And said elastic member will move to said migration supporter material of said 1st migration member and said 1st string-like part material, and a list in [ said 2nd interlocking member ] one, if said 2nd string-like part material pulls back according to the elastic force, and said 1st string-like part material moves.

[0011] The threader equipment of a sewing machine according to claim 5 is equipped with the 2nd migration member which is the 2nd fall block supported movable, and said 2nd string-like part material stretched by said the 2nd support device and said 2nd fall block as turned up in the contact part with said 2nd fall block. And on the other hand, said 2nd string-like part material turns up and moves in the direction of another side from a direction by rotation of said 2nd fall block.

[0012] The threader equipment of a sewing machine according to claim 6 is equipped with the threader device in which it has the hook which moves to the eye hole of said needle, by migration of said 1st interlocking member, said hook moves up and down, and approaches the eye hole of said needle and estranges it.

[0013] The threader equipment of a sewing machine according to claim 7 is equipped with the threader device in which it has a yarn attachment component holding yarn, by migration of said 1st interlocking member, said yarn attachment component moves up and down, and approaches said needle and estranges it.

[0014]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

[0015] As shown in drawing 1 and drawing 2 , the sewing machine 10 consists of the bed section 12 which has a horizontal plane, the pedestal section 14 set up from the right end section of the bed section 12, the arm section 16 which extends from the pedestal section 14 to the left, and the head section 18 used as the left end section of the arm section 16. In this head section 18 As opposed to the needle-bar drive 28 for moving a needle bar 26 up and down relatively to the sewing-machine frame 24 which constitutes head section 18 grade, and the sewing-machine frame 24 The threader device 38 for letting Yarn T pass by the threader hook 35 to the balance drive 34 for moving a balance 32 up and down with a predetermined phase to the needle-bar rocking device 30 for rocking a needle bar 26 horizontally relatively and a needle bar 26 and the needle 36 of the lower limit of a needle bar 26 is arranged. This needle 36 collaborates with the iron pot device 40 of bed circles, a needle 36 and a balance 32 move up and down with a predetermined phase mutually, and a seam is formed.

[0016] Like the sewing machine of an application for patent [ No. ("application of these above-mentioned people" is called hereafter.) 172264 / 2001 to ] publication, this sewing machine 10 is removable to a cassette mount 46 in the yarn cassette 44 which contains a yarn die 42, and is a configuration which

depresses the threader rod 47 caudad and weighs Yarn T also in a balance 32 by actuation of equipping with that yarn cassette 44 at coincidence. Furthermore, the transfer member 48 which transmits and intercepts the force which depresses the threader rod 47 is equipped with a sewing machine 10, and fundamentally, it is similar to application of these above-mentioned people with the sewing machine of a publication, and is explained below focusing on a different point.

[0017] After once descending to the eye hole 51 of a needle 36 and making the yarn attachment component 50 holding two places of Yarn T, and its yarn attachment component 50 approach the eye hole 51 of a needle 36 on the right-hand side of a balance 32 as this sewing machine 10 shows to drawing 3 unlike the sewing machine of application of these above-mentioned people, it is made to go up and the migration device 52 in which it is made to estrange from the eye hole 51 of a needle 36 is established. This migration device 52 is being fixed to the sewing-machine frame 24 through the support block 54 and the attachment member 56 which are shown in drawing 4 and drawing 5.

[0018] On the left-hand side of the cassette mount 46, among the threader devices 38, the threader hook device 55 about the threader hook 35 is arranged so that it may rock in radii by setting a rocking shaft as the center-of-oscillation shaft 58 with a needle bar 26. On the other hand, since the yarn attachment component 50 is being fixed to the sewing-machine frame 24 so that it may not rock with a needle bar 26, it is not necessary to miss for not making high outputs, such as a pulse motor which rocks a needle bar 26 and the threader rod 47, and making the migration device 52 rock, and to establish \*\*\*\* space in the interior of a sewing machine 10, and the miniaturization of a sewing machine 10 is attained.

[0019] Next, the migration device 52 is explained to this yarn attachment component 50 list.

[0020] As shown in drawing 6 (b), the yarn attachment component 50 has two parallel yarn maintenance arms 62 and 64, those yarn maintenance arms 62 and 64 open spacing, extend from the connection section 66 in parallel, and the pars intermedia of the rocking member 68 is supported rockable by the field on the left-hand side of the yarn maintenance arm 62 of the left in drawing 6 (b). At the spring reliance pin 74 to which the volume spring 72 let the rocking shaft 70 of the rocking member 68 pass, and the upper limit in drawing 6 (b) of the rocking member 68 was fixed The volume spring 72 contacts, the upper limit of the rocking member 68 in drawing 6 (a) is energized in the direction of a counterclockwise rotation considering the rocking shaft 70 as a core, and the lower limit in drawing 6 (b) of the rocking member 68 is located near the tip of the left yarn maintenance arm 62.

[0021] Rather than the rocking shaft 70, if are fixed so that the contact pin 76 may project to the left of drawing 6 (b), and the contact pin 76 winds, the elastic force of a spring 72 is resisted and it is pushed leftward [ of drawing 6 (a) ] by the rocking member 68 of the lower part in drawing 6 (b), to it, the lower limit of the rocking member 68 will estrange from the tip of the yarn maintenance arm 62 of the left in drawing 6 (b). That is, the yarn attachment component 50 is constituted possible [ closing motion ] so that Yarn T may be inserted.

[0022] The connection section 66 extends to the method of the right of drawing 6 (b), and the 1st interlocking member 78 of the migration device 52 is being fixed. This 1st interlocking member 78 is projected to the method of the right in drawing 6 (b), and as shown in drawing 6 (c), it is attached in the guide slot 84 where that lobe 80 was formed in the migration support plate 82 of the method of the right in drawing 6 (b) by penetrating possible [ sliding ]. The width of face of this guide slot 84 is extending to the longitudinal direction of the migration support plate 82 of the method of the right in drawing 6 (b), and that width of face is almost the same as the lobe 80 of the 1st interlocking member 78. By six spacing pins 88, 90, 92, 94, 96, and 98, the migration support plate 82 of the method of the right in drawing 6 (b) and the left migration support plate 86 open fixed spacing, and are attached in parallel.

[0023] A block 100,102 is supported pivotable by two upper spacing pins 88 and 90 in drawing 6, respectively, and the block 104 is supported by one spacing pin 98 of the lower part in drawing 6 pivotable. The pars intermedia of the 1st string-like part material 106 which is a metallic thin wire is applied to these blocks 100,102,104, and as are shown in drawing 6 (a), and right-and-left reversal of the character of abbreviation "N" was carried out, the 1st string-like part material 106 is turned up in the contact part with a block 100,104. This 1st string-like part material 106 is relatively movable to these blocks 100,102,104 and the migration support plate 82. That is, these blocks 100,104 are supporting the 1st string-like part material 106 movable. If the interlocking member 78 of the above 1st is fixed to the pars intermedia of this 1st string-like part material 106 and this 1st string-like part material 106 moves to it, the 1st interlocking member 78 will also move to one relatively to the migration support plate 82. The both ends of this 1st string-like part material 106 are attached possible [ sliding of the periphery of that fixed support pin 110,112 ], although it cannot estrange at the fixed support pin 110,112 which projects from the immobilization support plate 108.

[0024] In this way, the 1st string-like part material 106 is supported by the fixed support pin 110 of the immobilization supporter material 108 impossible [ migration of the one side of the 1st string-like part material 106 ] about the 1st string-like part material 106 of predetermined die length, when the lower part of drawing 7 moves, in addition the direction side is supported by the block 100 of migration supporter material movable. The 1st support device is constituted by the block 100 of the fixed support pin 110 of the immobilization supporter material 108, and the migration supporter plates 82 and 86. As 1st migration member, a block 104 contacts the 1st string-like part material 106 while being supported by this 1st support device, and moves the 1st string-like part material 106 to it. And while the 1st interlocking member 78 is connected with the 1st string-like part material 106 on the left of drawing 7 (other side) rather than the part which contacted the block 104 as 1st migration member, the yarn attachment component 50 as a threader device is connected. Moreover, when the 1st string-like part material 106 moves above drawing 7, the upper block 104 of drawing 7 acts as migration supporter material of the 1st string-like part material 106. Moreover, when the 1st string-like part material 106 moves above drawing 7, the block 104 of the lower part of drawing 7 acts as migration supporter material of the 1st string-like part material 106.

[0025] Therefore, if two migration supporter plates 82 and 86 move only distance d under drawing 7, in connection with it, only distance d will also move a block 100,104 under drawing 7. With those migration, the interstitial segment of the 1st string-like part material 106 is pushed on the lower part in drawing 7 by the block 104, and the 1st string-like part material 106 is sent only for die-length d to left-hand side (migration improper support side) by rotation of a block 104 from the right-hand side (movable support side) of the block 100. That is, when this block 104 moves under drawing 7, it functions as a fall block. The 1st interlocking member 78 and yarn attachment component 50 which were further fixed to the 1st right-hand side string-like part material 106 move only distance 2xd caudad rather than the block 100 on the right of this block 104. Thus, this migration device 52 is constituted so that the movement magnitude it is twice whose movement magnitude of a block 104 of this may be produced. In addition, whether one of the blocks 100,104 serve as a migration member as mentioned above depends in the migration direction of the 1st string-like part material 106.

[0026] Moreover, by 2nd string-like part material 114 with the 1st another string-like part material 106 attaching in this immobilization support plate 108, the edge of one side of Hidari's 2nd string-like part material 114 in \*\* and its drawing 7 is attached possible [ sliding of the periphery of that fixed support pin 116 ], although it cannot estrange at the fixed support pin 116 which projects from the immobilization support plate 108. Moreover, the edge of the 2nd string-like part material 114 of the right in the drawing 7 is attached possible [ sliding of the periphery of the spacing pin 90 ], although it cannot estrange at the spacing pin 90 which projects from the migration support plates 82 and 86.

[0027] The block 118 is in contact with the pars intermedia of this 2nd string-like part material 114, and the 2nd string-like part material 114 is turned up like the character of abbreviation "V" in the contact part with this block 118. This block 118 attaches this cassette contact object 120 possible [ sliding of the guide slot (figure abbreviation) formed in the immobilization support plate 122 of one more sheet shown in drawing 8 by penetrating ] by being connected so that it may move to the cassette contact object 120 and one, and is \*\*\*\*\*. If it is arranged in the rise-and-fall path of the yarn cassette 44 and is depressed to a predetermined location so that it may be depressed on the right-hand side of [ a part of ] the yarn cassette 44, the cassette contact object 120 is constituted so that it may estrange from the yarn cassette 44.

[0028] Between this immobilization support plate 108,122 of two sheets, it is set up and fixed so that both immobilization support plates 108,122 and four spacing pins 122,124,126,128 may cross at right angles, and the immobilization support plate 108,122 of two sheets opens spacing, and is located in parallel. Between them, the migration support plates 82 and 86 of the two above-mentioned sheets and the 1st string-like part material 106 are located, and the 2nd string-like part material 114 is located in a list.

[0029] Thus, the one side of 2nd another string-like part material 114 of predetermined die length is supported impossible [ migration ] by the fixed support pin 116 of the immobilization support plate 108, and the other side is supported movable by the spacing pin 90 of the migration support plates 82 and 86. The 2nd support device is constituted by the fixed support pin 116 of these immobilization support plate 108, and the spacing pin 90 of the migration support plates 82 and 86, the block 118 as 2nd migration member contacts the 2nd string-like part material 114 while being supported by this 2nd support device, and the 2nd string-like part material 114 is moved. While the spacing pin 90 of the migration support plates 82 and 86 as 2nd interlocking member is connected with the 2nd string-like part material 114 of the other side rather than the part which contacted the block 118, it is connected also with the block 104 as 1st migration member through the migration support plates 82 and 86.



[0030] Moreover, it has the length spring 132 as an elastic body which pulls back the 2nd string-like part material 114, and the length spring 132 is covered between the lower part of drawing 6 of the above-mentioned migration support plates 82 and 86, and the block attached member 134 which moves to one of the above-mentioned block 118, and it is arranged so that they may be mutually paid well. It is fixed to the migration support plates 82 and 86 so that the block 100 as migration supporter material which supports the other side of the 1st string-like part material 106 movable may move to the spacing pin 90 as 2nd interlocking member, the block 104 as 1st migration member, and a list in one. And it is supported by the fixed support pin 112 of the immobilization support plate 108 rather than the block 100 as migration supporter material still more nearly impossible [ migration of the 1st right-hand side (other side) string-like part material 106 ]. Therefore, it is easy to be short [ the length spring 132 ], and the miniaturization is attained rather than it prepares the length spring which pulls back the 1st string-like part material 106 which moves 4 times as for a long time as the 2nd string-like part material 114.

[0031] For example, if this cassette contact object 120 is moved only for distance  $d$  under drawing 7, by the block 118, the 2nd string-like part material 114 will be pushed caudad, and will move relatively to this block 118 or the cassette contact object 120. Only distance  $2xd$  moves the spacing pin 90 by which only die-length  $d$  was sent by rotation of a block 118, and the 2nd string-like part material 114 was connected with the edge of the 2nd string-like part material 114 of the right in drawing 7 from the right-hand side (movable support side) of the block 118 under drawing 7 to left-hand side (migration improper support side). That is, this block 118 is functioning as a fall block.

[0032] At this time, it is fixed to the spacing pin 90, and similarly, only distance  $2xd$  is united in down [ in drawing 7 ], and the migration support plates 82 and 86 of two sheets and the block 100,102,104 of those move caudad the edge of the 2nd string-like part material 114 of the right in drawing 7 to it. Drawing 7 is caudad pushed for the interstitial segment of the 1st string-like part material 106 by the block 104 with migration in those lower parts. The 1st string-like part material 106 is sent only for die-length  $2xd$  to left-hand side (migration improper support side) by rotation of a block 104 from the right-hand side (movable support side) of the block 104. Only distance  $4xd$  moves the 1st interlocking member 78 and yarn attachment component 50 which were further fixed to the 1st string-like part material 106 on the right of the right block 100 rather than this block 104 under drawing 6. Thus, this migration device 52 is constituted so that the movement magnitude it is 4 times whose movement magnitude of the cassette contact object 120 of this may be produced.

[0033] Next, the threader hook device 55 which moves the threader hook 35 of this sewing machine 10 is explained. As shown in drawing 9, like a sewing machine given in application of these above-mentioned people The threader hook 35 which can advance the eye hole 51 of a needle 36, The energization member 136 which always energizes the threader hook 35 up, and the attitude device 138 which advances the threader hook 35 into the eye hole 51 of a needle 36, and retreats, Energization member 136 The transfer location which transmits the downward force which resists the energization force to depend and moves the threader hook 35 below, It has the cassette contact object 139 prepared in the cassette insertion section 46 for descending the threader rod 47 to the movable transfer member 48 and wearing of the yarn cassette 44 with between the cutoff locations which intercepted transfer of the downward force. In addition, a part of the bottom is dented toward the upper part, and hook 35 catches yarn in the indented part.

[0034] It is a hauling spring for always energizing the threader rod 47 upwards in the energization member 136. In the attitude device 138, it is the pin 142 grade horizontally projected from that of the rotation member 140 (refer to drawing 10) attached in the threader rod 47 up, and its threader rod 47. According to this rotation member 140, the threader rod 47 descends with wearing of the yarn cassette 44, and if the expanding pin 144 which projects from that threader rod 47 contacts the height adjustment member 146 fixed to the needle bar 26, the pin 142 of the threader rod 47 will descend along the straight-line slot 148 of the rotation member 140. And if the threader rod 47 descends to a position, a pin 142 arrives at the spiral slot 150 of the rotation member 140, the threader rod 47 and the threader hook 35 rotate, and the threader hook 35 advances into the eye hole 51 of a needle 36, and projects from the opposite side of the eye hole 51 of a needle 36. And if the above-mentioned transfer member 48 will be in the cut off state near a perpendicular condition posture and the threader rod 47 goes up according to the energization force of an energization member, the threader hook 35 will carry out inverse rotation, and the threader hook 35 will retreat from the eye hole 51 of a needle 36.

[0035] It lets the transfer member 48 pass possible [ sliding of the guide shaft 151 ], and the central part of the transfer member 48 is rolled as it is in the transfer location shown in drawing 11, and it is supported pivotable and it is energized by the energization member 152 which is a spring. When it is in the transfer

location, the transfer member 48 leans for a while from the perpendicular posture, is the upper limit 153 of the transfer member 48, can contact above the contact section 154 of the upper part of the rotation member 140, and can transmit the force which descends the threader rod 47. Moreover, the energization force of the energization member 152 is resisted, the transfer member 152 rotates, and if it moves to the cutoff location shown in drawing 12, the upper limit 153 of the transfer member 48 will estrange from the contact section 154. That is, the threader rod 47 is made into the condition that it can go up according to the energization force of the energization member 136. ABS or polyacetate resin for protection of the contact section 154 of the rotation member 140 of resin is wound around the upper part 153 of this metal transfer member 48. Although this transfer member 48 is always energized up by the energization member 155 which is a length spring, it resists that energization force and is caudad moved by wearing of the yarn cassette 44.

[0036] Unlike application of these above-mentioned people, by this sewing machine 10, the contact member 158 which moves the transfer member 48 to a cutoff location in contact with the transfer member 48 is formed as follows. If the above-mentioned migration device 52 moves the yarn attachment component 50 to a predetermined location, the contact member 158 is being fixed to the support block 54 so that the contact member 158 may move the transfer member 48 to a cutoff location in contact with the transfer member 48. That is, this support block 54 is being fixed to the sewing-machine frame 24, and with vertical movement of a needle bar 26 or a needle 36, and horizontal rocking, this contact member 158 is arranged, as it is not concerned but is in a fixed location. In the opposite side of the eye hole 51 of the needle 36 with which the threader hook 35 projects, the position about the yarn attachment component 50 is a location of the upper part [ hook / 35 / which was projected from the eye hole 51 of a needle 36 / threader ], in order that the threader hook 35 may catch Yarn T. That is, it is the location which it goes up [ location ] so that Yarn T may intersect the threader hook 35 projected from the eye hole 51 of a needle 36, and Yarn T is positively pressed [ location ] against the threader hook 35 bottom, and is making Yarn T crooked slightly.

[0037] Unlike application of these above-mentioned people, the slit type balance 32 and the tabular guide member 160 which extends right and left on both sides of that balance 32 are formed, and if the yarn T horizontally stretched by the yarn cassette 44 from the upper part of a balance 32 descends along with the upper limit of this guide member 160, the sewing machine 10 consists of this sewing machine 10 so that that yarn T may be led to a balance 32.

[0038] Moreover, by this sewing machine 10, unlike application of these above-mentioned people, there is yarn T stretched independently for the above-mentioned balance 32, the above-mentioned yarn attachment component 50 catches that another yarn T to the yarn cassette 44 with wearing of the yarn cassette 44, and that yarn T is caudad moved to it toward the eye hole 51 of a needle 36.

[0039] The threader actuation at the time of equipping with the yarn cassette 44 the sewing machine 10 constituted as mentioned above is explained.

[0040] By this sewing machine 10, the yarn to a balance 32 or the threader to the eye hole 51 of \*\* and a needle 36 is completed only by pushing the yarn cassette 44 caudad until an operator inserts the yarn cassette 44 in a cassette mount 46 from the upper part and the yarn cassette 44 arrives at the bottom of a cassette mount 46. While pushing the cassette contact object 120 on the right-hand side of [ a part of ] the yarn cassette 44 at this time, a part of central site of the yarn cassette 44 pushes the cassette contact object 139 below. That is, the attitude device 139 of the threader device 38 and the migration device 52 operate in manual operation by the manual operation of pushing the yarn cassette 44 on descent. The threader rod 47 descends by the actuation.

[0041] Moreover, in the front of the yarn cassette 44, Yarn T extends in the direction which intersects perpendicularly with the space of drawing 6, and is stretched in it, and it is caught by the yarn attachment component 50 to which this stretched yarn T descends from the location of drawing 13. The yarn attachment component 50 moves distance about 4 times the distance of the cassette contact object 120 having been pushed on the yarn cassette 44, and having moved at this time. And as shown in drawing 14, the yarn attachment component 50 descends most. At this time, the inside of the predetermined vertical range (the yarn attachment component 162 located in order to carry out a threader to drawing 15 in the eye hole 51 of the needle 36 of an upper limit location and a minimum location is illustrated) in which a threader is possible to a needle 36, Caudad rather than the location where the threader hook 35 projects from the opposite side of the eye hole 51 of the needle 36 which stops in the lowest location After the migration device 52 moves two of the yarn maintenance arms 62 and 64 of the yarn attachment component 50, the threader hook 35 projects from the opposite side of the eye hole 51 of a needle 36 according to the attitude device 138, as shown in drawing 16. in addition -- although the location holding the yarn T of the yarn maintenance arms 62 and 64 is shifted up and down a little as shown in drawing 15 -- any of the yarn



maintenance location -- although -- it consists of the opposite side of the eye hole 51 of the needle 36 which stops in the lowest location of the threader possible range caudad rather than the location where the threader hook 35 projects.

[0042] The migration device 52 moves the yarn attachment component 50 upwards so that two yarn maintenance arms 62 and 64 may be moved more nearly up than the threader hook 35 projected from the eye hole 51 of the needle 36. That is, since the yarn attachment component 50 goes up after [ the threader hook 35 projected from the eye hole 51 of the needle 36 when located in the vertical range in which the threader which the eye hole 51 of a needle 36 shows to drawing 15 is possible ] the yarn attachment component 50 moves caudad, it differs [ having only only stretched Yarn T like before, and ], and Yarn T is made to intersect the threader hook 35 positively. In addition, since a migration device 52 is not concerned with the vertical halt location or the horizontal rocking location of a needle bar 26 on the occasion of a threader but it has only the fixed moving trucking of dropping the yarn attachment component 50 caudad, rather than the location where the threader hook 35 projects from the opposite side of the eye hole 51 of the needle 36 which stops to a needle 36 in the lowest location among the predetermined vertical range in which a threader is possible, the migration device 52 ends with an easy configuration.

[0043] At the time of this rise, between two yarn maintenance arms 62 and 64, after the threader hook 35 has inserted, it moves from the location which is shown in drawing 14 and which descended most. If the two yarn maintenance arms 62 and 64 reach more nearly up than the threader hook 35 and the yarn attachment component 50 is moved to the location of flume \*\*\*\*\*, the transfer member 48 will contact the contact member 158, it will move to a cutoff location from a transfer location, and the threader rod 47 will go up up according to the elastic force of an elastic body.

[0044] In this rise process, as shown in drawing 17 , it is supported by the threader hook attachment component 162, and the point of the left yarn maintenance arm 62 runs against the lower part of the threader hook attachment component 162, therefore the climbing speed of the yarn attachment component 50 by the migration device 52 is controlled, and, on the other hand, the yarn attachment component 50 does not move the threader hook 35 to a target upwards rather than the eye hole 51 of a needle 36. That is, to the pulling-back-2nd string-like part material 114 length spring 132, a load called the contact to the yarn attachment component 50 and the threader hook attachment component 162 was added, and the rate of a rise of the yarn attachment component 50 was controlled (reduction). The threader rod 47 anti-rotates, and the contact to this yarn attachment component 50 and the threader hook yarn attachment component 162 is continued until a threader 35 estranges completely from the eye hole 51 of a needle 36. As shown in drawing 18 , the threader hook 35 retreats from the eye hole 51 of a needle 36, it cancels, and with the above-mentioned length spring 132, the 2nd string-like part material 114 is pulled back, and the contact to the yarn attachment component 50 and the threader hook attachment component 162 goes up [ the yarn attachment component 50 gathers a rate and ].

[0045] In addition, it will evacuate from the moving trucking of the yarn cassette 44, the above-mentioned length spring 132 will come to be effective, the 2nd string-like part material 114 will be pulled back, and the cassette contact object 120 will return to the original condition as shown in drawing 7 , if it is pushed on the yarn cassette 44 and specified quantity migration is carried out. That is, the yarn attachment component 50 goes up.

[0046] In the gestalt of operation mentioned above, in the sewing machine 10 using the yarn cassette 44, although the invention in this application was carried out, the invention in this application may be carried out to the sewing machine 10 which does not use the yarn cassette 44. In that case, a threader control lever is prepared and it performs manual operation of a threader, and it constitutes so that the threader device 38 may operate by the manual operation. In the gestalt of operation mentioned above, although the invention in this application was carried out to the sewing machine 10 which faces horizontally to the sewing-machine frame 24, and rocks a needle 36, a needle 36 may be used for the sewing machine 10 which is not rocked horizontally.

[0047] Although Yarn T is horizontally stretched in the gestalt to the operation mentioned above, Yarn T may be stretched in the vertical direction, and it moves to it horizontally in that case, and is made for the threader hook 35 and Yarn T to cross. If \*\*\*\*\* intersects the operation mentioned above in two yarn maintenance arms 62 and 64 and intersects the threader hook 35 in Yarn T with a gestalt in the migration case, what is necessary is just one [ at least ] yarn attachment component 50.

[0048] Although the yarn attachment component 50 was moved to the operation mentioned above in the gestalt using the fall block, the threader hook 35 may be moved. Moreover, although the thin wire was used with the gestalt of operation mentioned above, a belt without a gear tooth, a timing belt, a gear, etc. may be

used. Although the fall block is used for the operation mentioned above with the gestalt, as long as string-like part material is movable similarly, you may be things, such as a mere cylinder.

[0049] Although the invention in this application was carried out with the gestalt of operation mentioned above to the sewing machine 10 which rocks a needle 36 to a longitudinal direction, you may carry out by the sewing machine 10 which rocks a needle 36 to a cross direction.

[0050] Although the migration device 52 is constituted so that the yarn attachment component 50 may descend in parallel with a needle 36 and may go up in parallel with a needle 36 again in the gestalt of operation mentioned above in the close predetermined range of the needle 36 after the yarn attachment component 50 approaches a needle 36. To a needle 36, it is not parallel and the migration device 52 may move the yarn attachment component 50 aslant to a needle 36. In the gestalt of operation mentioned above, although the migration device 52 is moving the yarn attachment component 50 in parallel to a needle 36 at the time of the migration at both times of descent of the yarn attachment component 50, and a rise, the migration device 52 may move the yarn attachment component 50 in parallel to a needle 36 only at the time of one at the time of descent or a rise of migration.

[0051]

[Effect of the Invention] Since the 1st string-like part material longer than the movement magnitude of a migration member moves, with the threader equipment of a sewing machine according to claim 1, the control input of migration of a threader device can be lessened, so that clearly from having explained above.

[0052] With the threader equipment of a sewing machine according to claim 2, since the 1st string-like part material turns up and moves in the direction of another side from a direction on the other hand by rotation of the 1st fall block, the 1st string-like part material can be moved efficiently, and the control input of migration of a threader device can be lessened.

[0053] Since the 1st string-like part material is moved by migration of the 2nd string-like part material and the 2nd string-like part material moves on both sides of the 2nd migration member by it in the threader equipment of a sewing machine according to claim 3. Since the 2nd string-like part material which moved is longer than the migration length of the 2nd migration member and the 1st string-like part material which moved is longer than the 2nd string-like part material which moved, the control input of migration of a threader device can be lessened.

[0054] With the threader equipment of a sewing machine according to claim 4, since an elastic member will move to the migration supporter material of the 1st migration member and the 1st string-like part material, and a list in [ the 2nd interlocking member ] one if the 2nd string-like part material pulls back according to the elastic force, and the 1st string-like part material moves, an elastic member can be shortened.

[0055] With the threader equipment of a sewing machine according to claim 5, since the 2nd string-like part material turns up and moves in the direction of another side from a direction on the other hand by rotation of the 2nd fall block, the 2nd string-like part material can be moved efficiently, and the control input of migration of a threader device can be lessened.

[0056] With the threader equipment of a sewing machine according to claim 6, since a hook moves up and down, and the eye hole of a needle is approached and it estranges by migration of the 1st interlocking member, the control input of migration of a hook can be lessened.

[0057] With the threader equipment of a sewing machine according to claim 7, since a yarn attachment component moves up and down, and a needle is approached and it estranges by migration of the 1st interlocking member, the control input of migration of a yarn attachment component can be lessened.

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[Translation done.]

\* NOTICES \*

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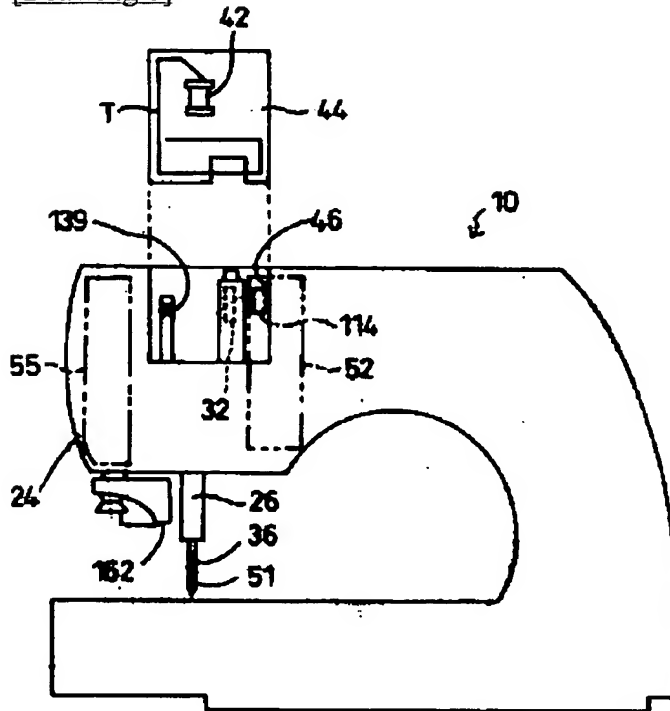
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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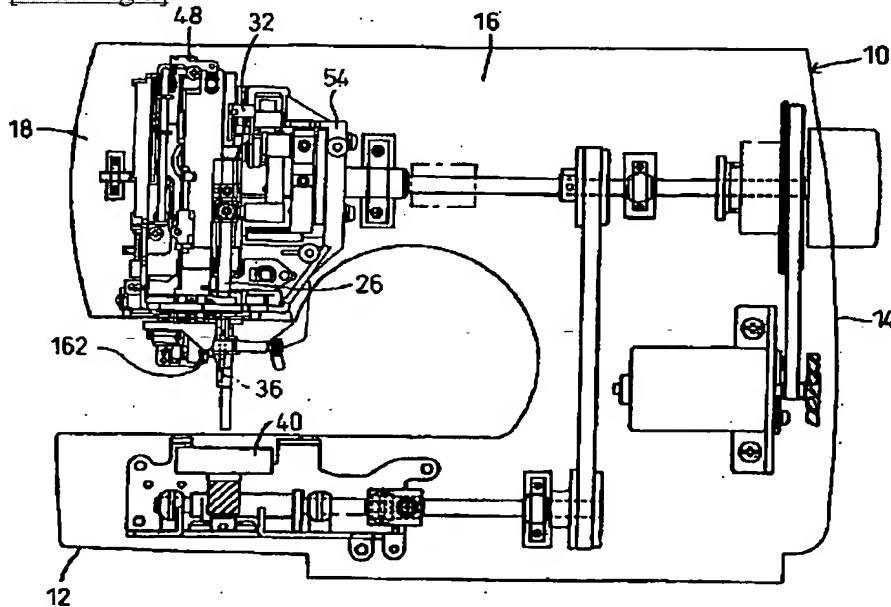
DRAWINGS

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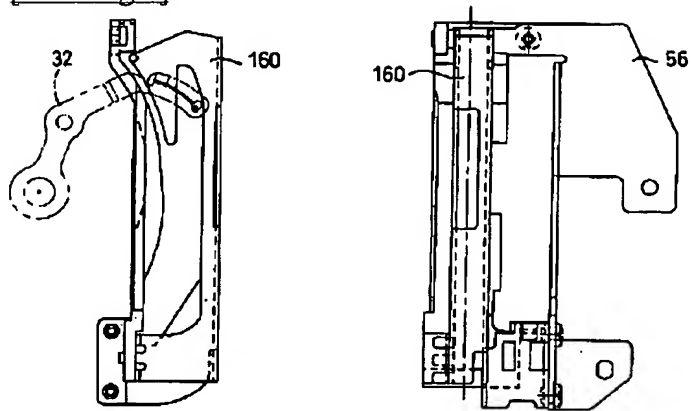
[Drawing 1]



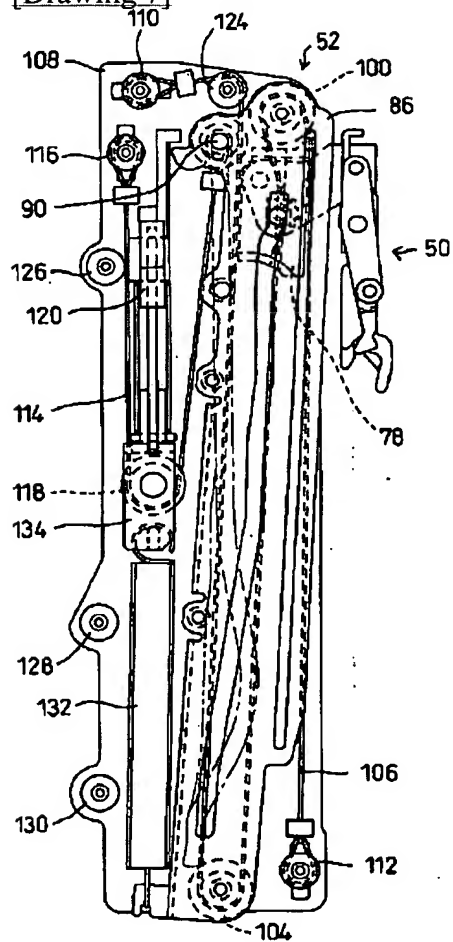
[Drawing 2]



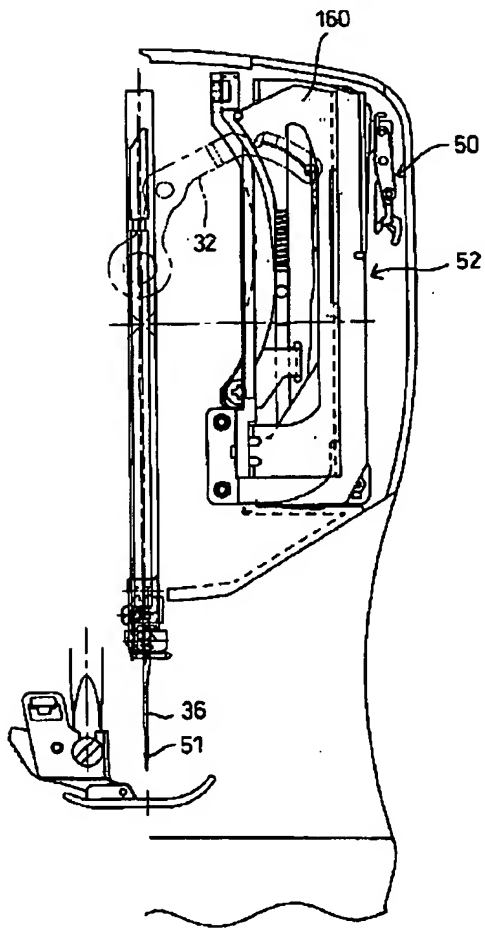
[Drawing 5]



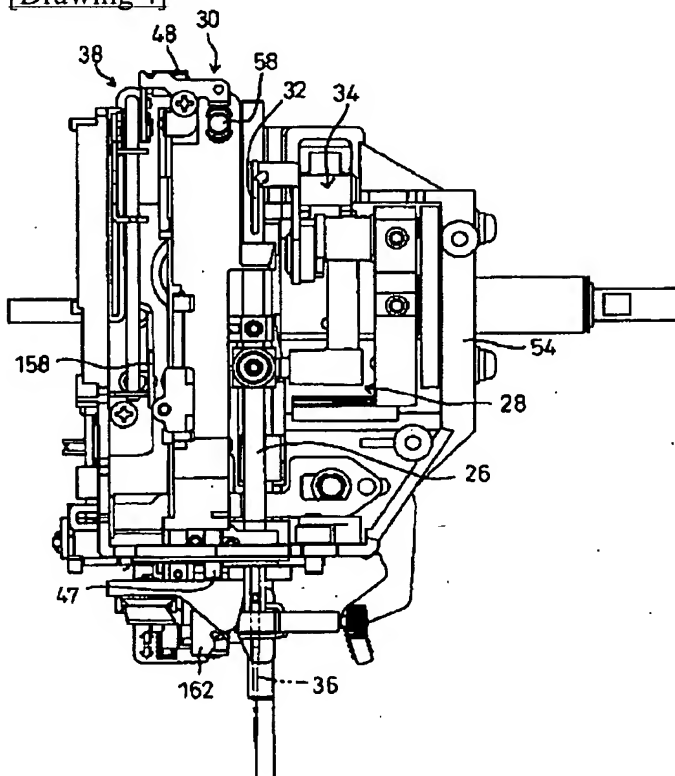
[Drawing 7]



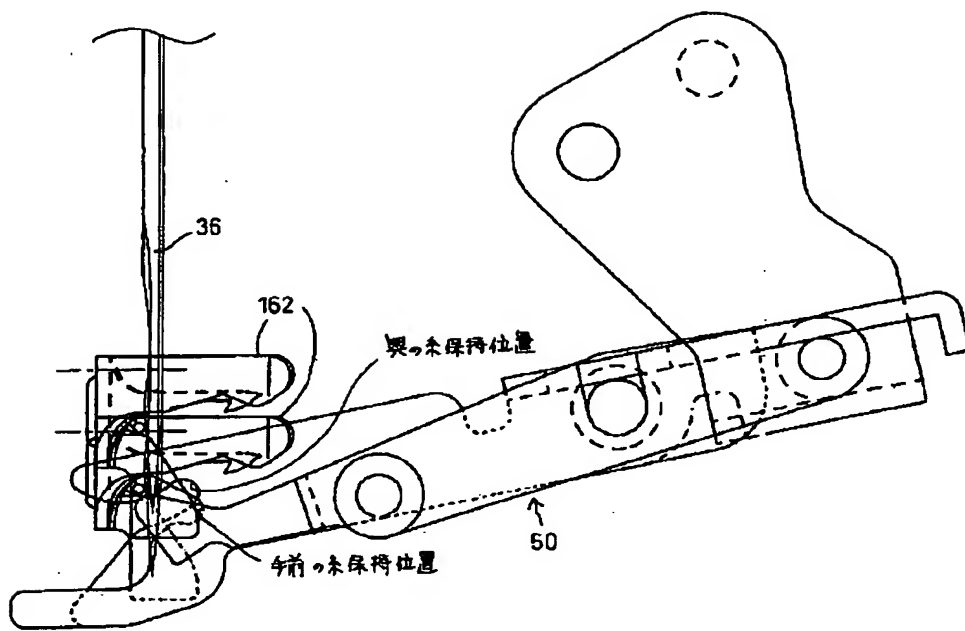
[Drawing 3]



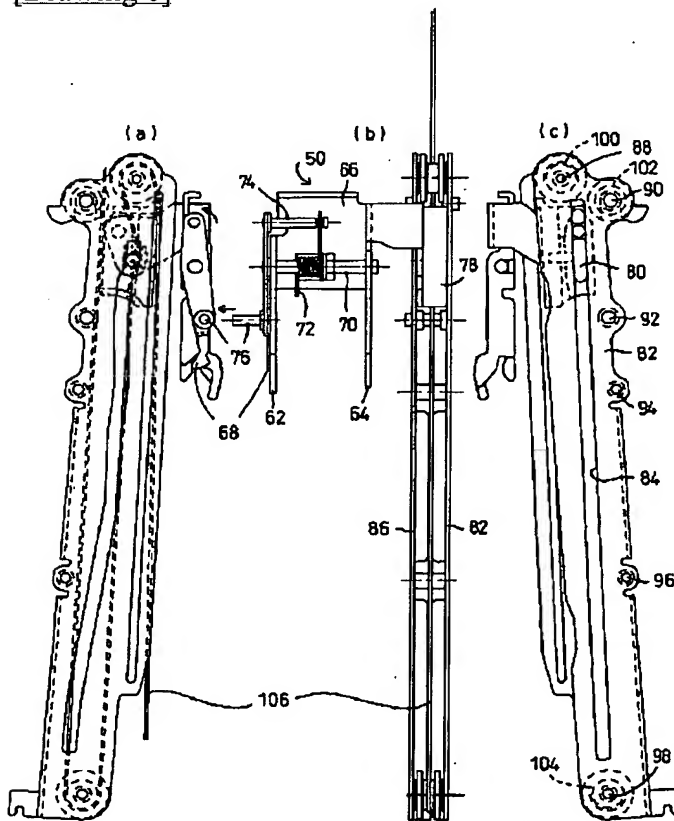
[Drawing 4]



[Drawing 15]

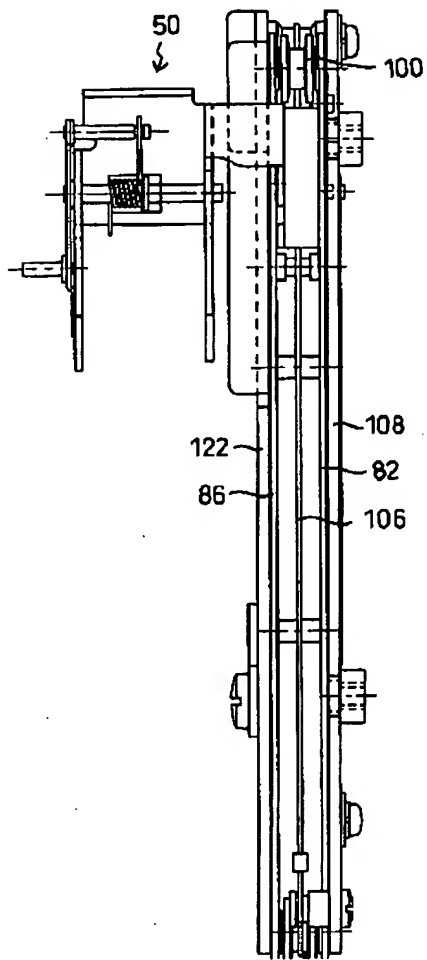


[Drawing 6]

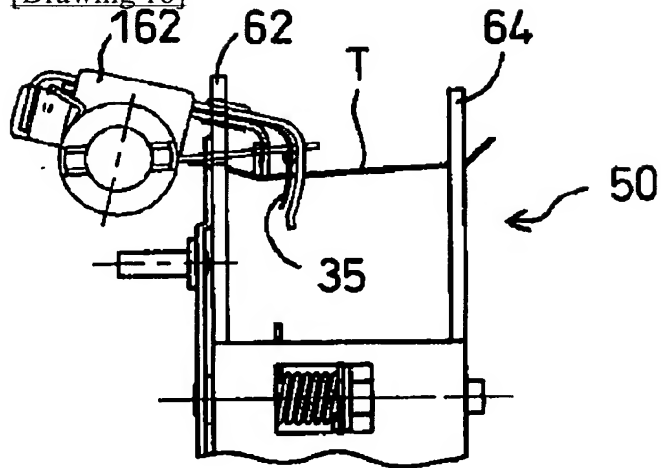


[Drawing 8]

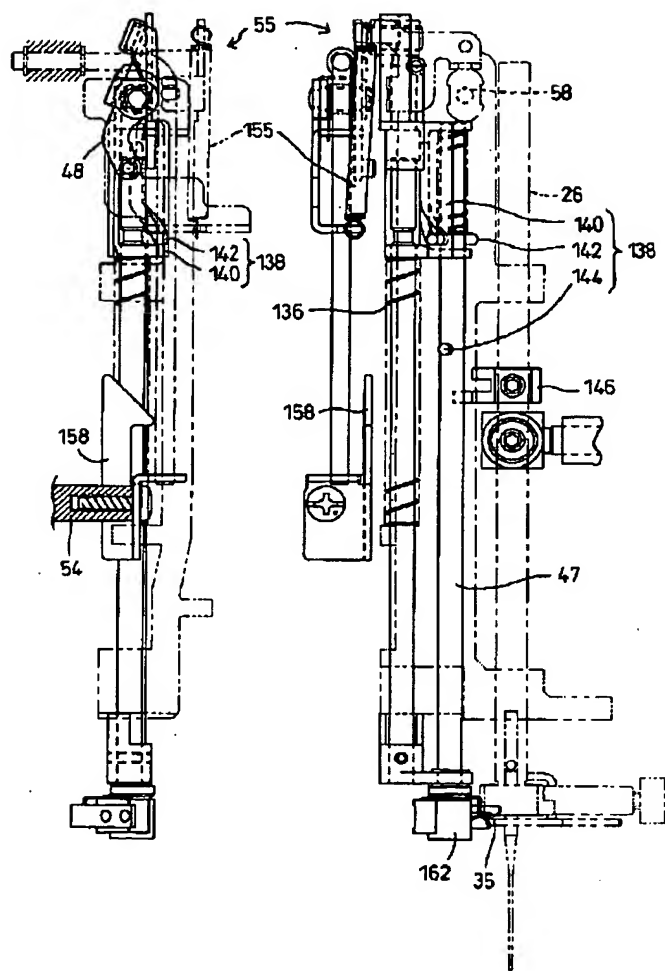




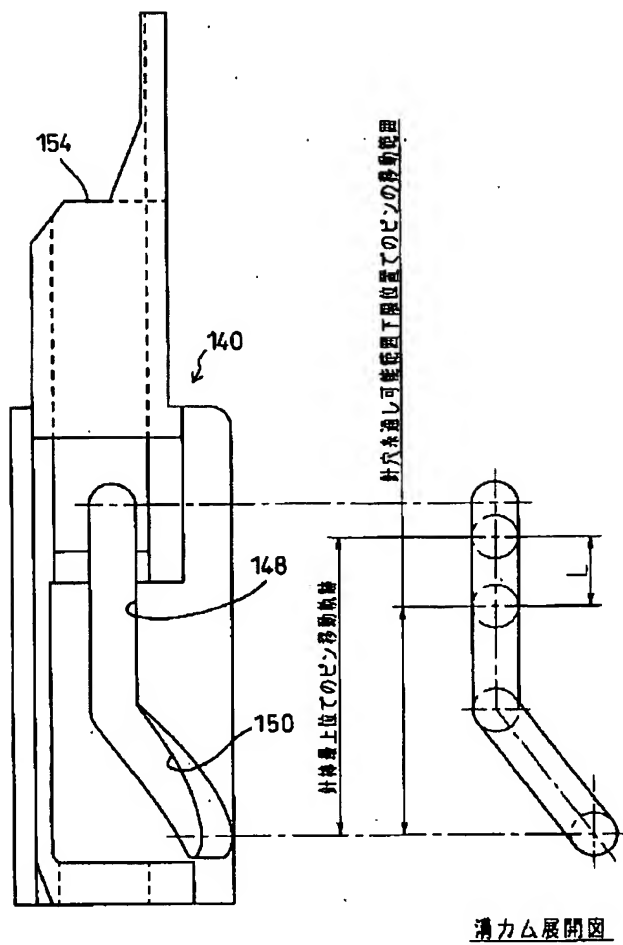
[Drawing 16]



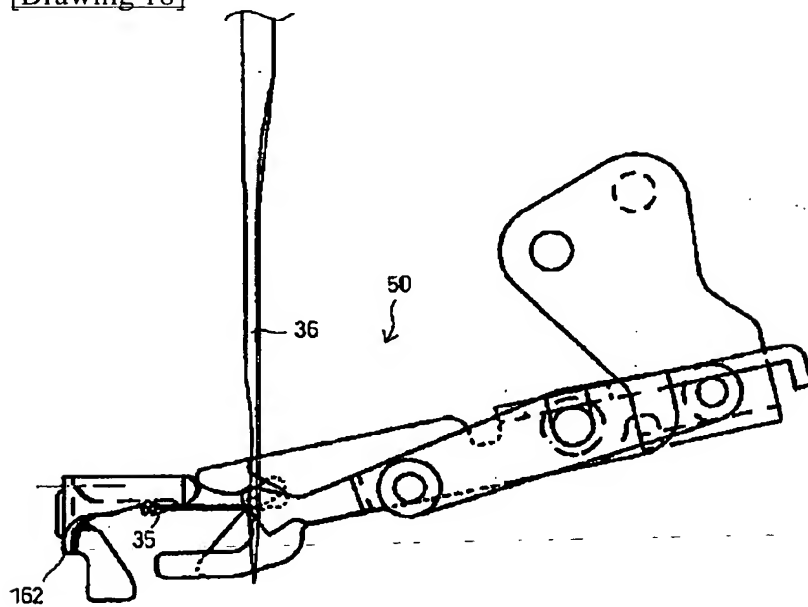
[Drawing 9]



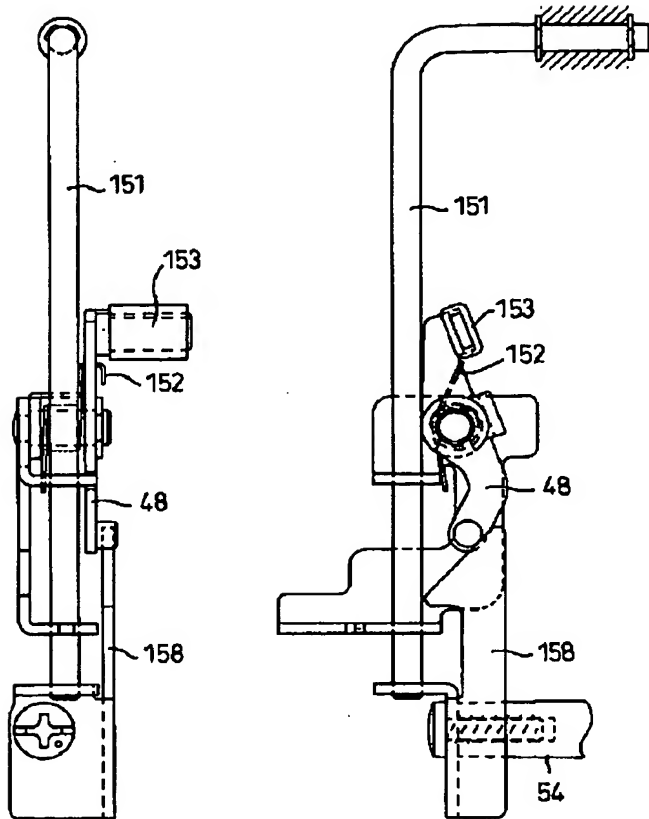
[Drawing 10]



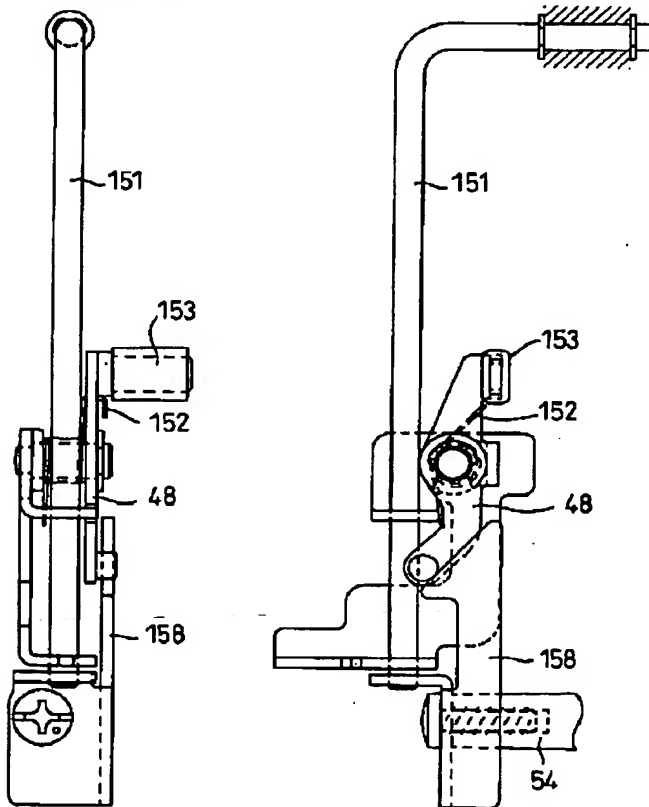
[Drawing 18]



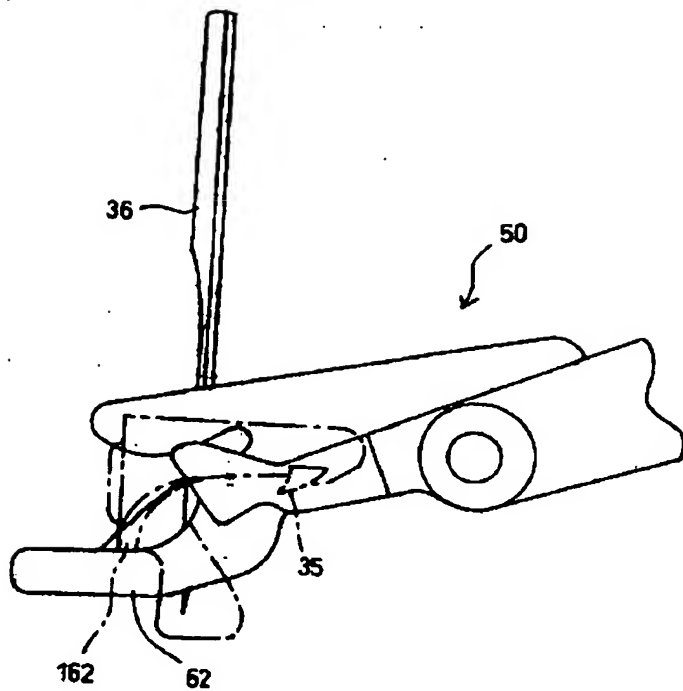
[Drawing 11]



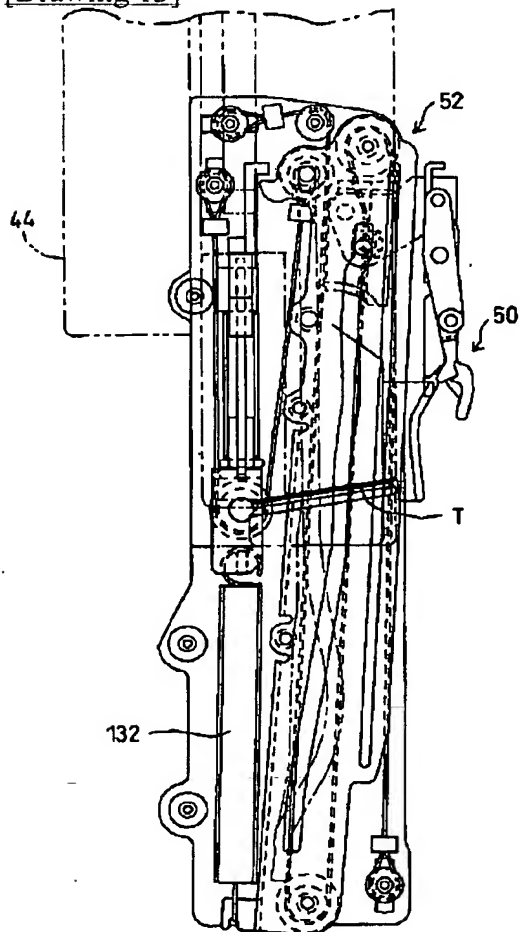
[Drawing 12]



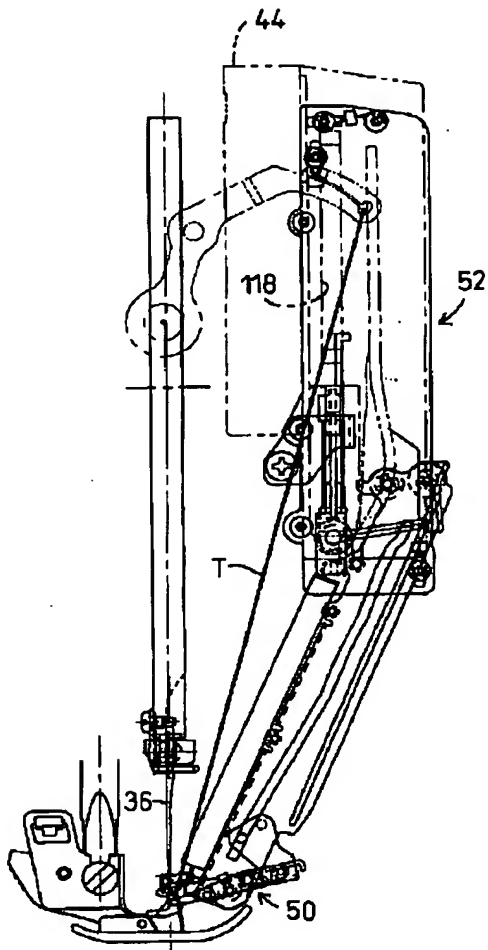
[Drawing 17]



[Drawing 13]



[Drawing 14]



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[Translation done.]